Designing Interactive Systems

rooms: B109 – B107
time: 14h00 – 17h00

Wendy E. Mackay
Tuesday, 18 December 2012
lecture 4

Today

Homework:
- Design concept (group)
- Function-Interaction Table (group)
- Design scenario (group)

Lectures:
- Rapid prototyping
- Video prototypes

Class work:
- Storyboard with 6-8 interaction points
- Create paper prototypes
- Video prototype 1

due Jan. 8:
- Mid-term assessment
- Video prototype (5-7 minutes)

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Go to:
- insitu.lri.fr/People/Mackay
and click on:
- Design and Evaluation of Interactive Systems
or
Website: http://insitu.lri.fr/People/DesignAndEvaluationOfInteractiveSystems

Generative Design

Discovery
Who is the user?

Invention
What is possible?

Design
What should it be?

Evaluation
Does it work?

Redesign
How to improve it?
Design: What should it be?

Collect information
Design brief
plus results from earlier phases

Analyse information
Function-Interaction table
Design alternatives

Resources for design
Design scenario
Storyboard
Mockups & Paper prototypes
Video prototype

Design concept
User descriptions

Design scenario
Create a tiny one-act play,
sub-divided into one-paragraph micro scenes
that describe a series of 'interaction points'

Include one or more personas (characters), each with:
name, age, gender, motivation
usually with a profession, expertise
usually with a goal or motivation

Create one or more realistic setting(s):
date, time, place, context

Identify a series of events over a period of time
### Design scenario

Think about each interaction point:
how would your personas use your system at this point?

At each interaction point:
what does the user see (or hear)?
what does the user do?
what does your system do?

Remember, tell a story, step-by-step, about how your personas will interact with your new system.

Use the process to help you define the details of your system.

### Design Scenarios: What to do

- Create a theme … and variations to explore alternatives
- Balance both ‘normal’ and unusual situations especially breakdowns and errors (… and normal is rarely normal)
- Consider external events that affect interaction as well as motivated action by the user
- Include patterns of interaction over time including repetitions and wasted effort
- Highlight surprises

### Design Scenarios: What NOT to do

- Avoid ‘selling’ the technology
  - Explore options rather than one solution
- Avoid irrelevant detail
  - Focus on interaction, not users’ personal lives
- Avoid flowery description
  - Stick to the facts
- Avoid humor, at least for now
  - Difficult to do well
  - Often distracting

### Prototyping interaction

- Design scenario
  - Imagine the system from the user’s perspective
- Wizard of Oz
  - Simulate the system live with a human operator ‘behind the curtain’
- Video Prototype
  - Illustrate the use of the system in context “sketch” dynamic, interactive user experiences
- Simulation
  - Create a working subset of the system
**What is a prototype?**

Prototype = concrete representation of an interactive system

**Characteristics**

- **Representation:** form of prototype - sketches - simulations
- **Precision:** level of detail - informal - complete
- **Interactivity:** interaction - watch - interact
- **Evolution:** lifecycle of prototype - throw out - iterative

The choice of prototype depends upon the design phase and the specific needs of the designers.

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**Prototyping helps you...**

- Consider different design alternatives
- Ensure usability under diverse conditions
- Help users and other stakeholders imagine the interface
- Focus on problematic parts of the interface

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**Rapid prototypes**

**Goal:** Design the interface as rapidly as possible to explore ideas

**Materials:**
- Paper (white, colored, transparencies, post-its)
- Colored pens and markers
- Tape, glue, scissors, cutters
- Foam, cardboard, etc.

Show how a user will interact with the device you are designing.

**Representation**

- **Paper prototypes**
  - Easy and fast to create and to throw away
  - Most useful at the beginning of the design process
  - examples: sketches for an idea for an icon, storyboard sequences, mockups of screens, video prototypes of a complex interaction

- **On-line prototypes**
  - Use the computer, longer to create, more polished
  - More appropriate later in the design process
  - examples: animations, interactive videos, scripting languages, interface builders
### Precision

<table>
<thead>
<tr>
<th>Lo fidelity (lofi) prototypes with little detail</th>
<th>High fidelity (hifi) prototypes, very detailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great for rapid exploration of ideas</td>
<td>Good to communicate specific design considerations</td>
</tr>
<tr>
<td>example: paper sketches, SILK</td>
<td>example: dialog box with layout alternatives</td>
</tr>
</tbody>
</table>

**Note:** A detailed representation is not always precise. It is possible to omit aspects that have not yet been decided.

### Details

- A system can be good in theory but unusable in practice because of flaws in the interface … even small ones.
- Good prototypes let designers work with different sets of details at the same time.
- Good prototypes allow users to envision the final system: but also to feel comfortable suggesting changes.

### Level of Interactivity

<table>
<thead>
<tr>
<th>Non-interactive (fixed)</th>
<th>Low interaction (pre-determined path)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No interaction, but can show potential interaction</td>
<td>Can test several alternative forms of interaction</td>
</tr>
<tr>
<td>example: a video clip showing user interacting with a device</td>
<td>example: designer shows a screen shot, user indicates her action, the designer shows the result</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>High interaction (open)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users interacts with the system, with some limitations</td>
</tr>
<tr>
<td>example: Wizard of Oz or computer-based simulation</td>
</tr>
</tbody>
</table>

### Wizard of Oz

- Technique for prototyping novel user interfaces.
- **Wizard of Oz:** Designer ‘plays computer’ to create an interactive experience for the user.
- Useful for creating video prototypes but also for creating live experiences that rapidly explore different design alternatives.
Wizard of Oz

The designer/wizard interprets the actions of the user and controls the responses of the system. The user experiences what the 'real' system might be like.

The system may be:
- non-existent
- partially built
- completely functional

Best for certain types of interaction (based on wizard's reaction time)

Evolution

Rapid prototypes: Early exploration of diverse alternatives
- Easy to create, check, throw away afterwards
  - example: paper prototype or interface like SILK

Iterative prototypes: create individual modules
- Create successively more refined versions
  - example: series of prototypes, successively more detailed

Evolving prototypes: may become the final product
- Different completed sections are successively added
  - example: a software module has functionality added before being added to the final system

Prototyping strategies

Horizontal: complete one layer of functionality at a time
- example: develop the details of the interface without a working database

Vertical: complete functionality of part of the system
- example: develop the spelling checker first

Task: create functionality necessary for a single task
- example: develop the interface for adding and editing an image

Scenario: create functionality needed to run a scenario
- example: develop the functions needed to edit three images and spell-check a document within a design scenario

Design Scenarios lead to storyboards

Title: What is the name of your system?
- (you may use a subtitle too)

Who?: Personas: name, sex, age, profession, ...

Where?: Location

When?: Date, time

Motivation: Why is this happening?

Situation: Relevant detail to aid understanding

Story: Paragraph-by-paragraph description of who does what and why, from one interaction point to the next

Regular storyboard

- Identify key interaction points in the scenario
- Examine the key ideas from the design space (brainstormed ideas)
- Illustrate the interaction between user and novel system
- Describe key issues on the right

<table>
<thead>
<tr>
<th>Regular storyboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
</tr>
<tr>
<td>User(s)</td>
</tr>
<tr>
<td>Situation</td>
</tr>
<tr>
<td>Establishing shot</td>
</tr>
<tr>
<td>First interaction</td>
</tr>
<tr>
<td>Closeup shot</td>
</tr>
<tr>
<td>Second interaction</td>
</tr>
<tr>
<td>Mid-range shot</td>
</tr>
<tr>
<td>Third interaction</td>
</tr>
<tr>
<td>Wide shot</td>
</tr>
<tr>
<td>Forth interaction</td>
</tr>
<tr>
<td>Final credits</td>
</tr>
</tbody>
</table>

Storyboard structure

- System title
- Group
- Buena Vista CommApp
- Pierre leaves a message
- close-up show the interaction
- Anne and Pierre are engaged, but live in different towns... It's in a meeting... intertitle explain the situation
- establishing shot show the situation
- mid-shot show Pierre and the technology
- mid-shot continue the story
- credits Group members

Next … Video Prototyping

Video Prototypes

- Find an empty room
- Bring a portable whiteboard
- Think about how you will shoot
  - Better special effects: pause button!
  - shoot in order!
  - zoom in, then out, then in while recording
  - stabilize the shot – tripod, against your body
- Bring all the materials